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15-- INTERSTATE COMMERCE COMMISSION.

**REPORT OF THE CHIEF INSPECTOR OF SAFETY APPLIANCES
COVERING HIS INVESTIGATION OF AN ACCIDENT WHICH OC-
CURRED ON THE ST. LOUIS & SAN FRANCISCO RAILROAD NEAR
CHELSEA, OKLA., ON OCTOBER 29, 1913.**

DECEMBER 29, 1913.

TO THE COMMISSION:

On October 29, 1913, there was a derailment of a passenger train on the St. Louis & San Francisco Railroad near Chelsea, Okla., resulting in the death of the engineman and the injury of the fireman. This accident was investigated jointly with the Corporation Commission of Oklahoma, and testimony was taken at a hearing held in Oklahoma City, Okla., on November 4, 1913. As a result of the investigation of this accident I beg to submit the following report:

Westbound train No. 11, known as "The Meteor," was en route from Kansas City, Mo., to Oklahoma City, Okla. It consisted of one mail car, one baggage car, one combination car, one chair car, and three Pullman sleeping cars, hauled by locomotive No. 631, and was in charge of Conductor Powers and Engineman Hart. The mail car was of steel construction, the baggage car had a steel underframe, and the combination and chair cars were of steel construction, while the sleeping cars were of wooden construction. This train was delivered to the Cherokee subdivision of the southwestern division, on which the derailment occurred, at Afton, Okla., and left that point at 3.18 a. m., 8 minutes late. It passed White Oak, Okla., the last telegraph station east of the point of derailment, and 12 miles distant therefrom, at 3.57 a. m., and was derailed about 4.17 a. m. at a point 660 feet east of the east passing-track switch at Chelsea while running at a speed estimated to have been about 40 miles per hour.

The forward tender trucks of the locomotive were the first wheels derailed and ran along the roadway until the passing-track switch was reached. At this point the derailed truck came in contact with the switch and broke the frog and one throw rail. The engine and tender continued westerly on the main line for a distance of about 200 feet before turning over to the right. The cars making up the train were diverted at the switch to the passing track, which was on the left-hand side of the main track. The first three cars were derailed, but remained upright, the forward end of the first car coming to a stop at a point slightly in advance of where the engine lay on the opposite side of the main track.

This part of the St. Louis & San Francisco Railroad was a single-track line. Trains were operated by means of train orders and the manual block system, telephones being used in connection therewith. The track approaching the point of derailment, which was near the top of a short ascending grade of about one-half per cent, was straight for a considerable distance. It was laid with 85-pound rails, with from 19 to 21 oak or creosoted ties under each rail. All ties were single-spiked and tie-plates were used in some places. The ballast was of chatt, averaging about 8 inches in depth. At a point about 100 feet east of the point of derailment was a soft spot about 20 feet in length. This always caused more or less trouble, and during wet weather required constant attention, it being necessary to line and surface it every day. At the time of the derailment no slow orders were in force affecting any of the track or bridges in this vicinity. The weather at the time was clear. Careful examination of the trucks, wheels, center castings, etc., of both the engine and tender showed nothing which could have caused this derailment. The interior of the tender was equipped with 23 splash plates. Five of them were found resting on the bottom of the tender, but this condition is not believed to have contributed to the accident in any way. The engine hauling this train was of the 4-6-0 type, and weighed 182,500 pounds. The tender weighed 132,800 pounds, and had a coal capacity of 14 tons and a water capacity of 6,000 gallons.

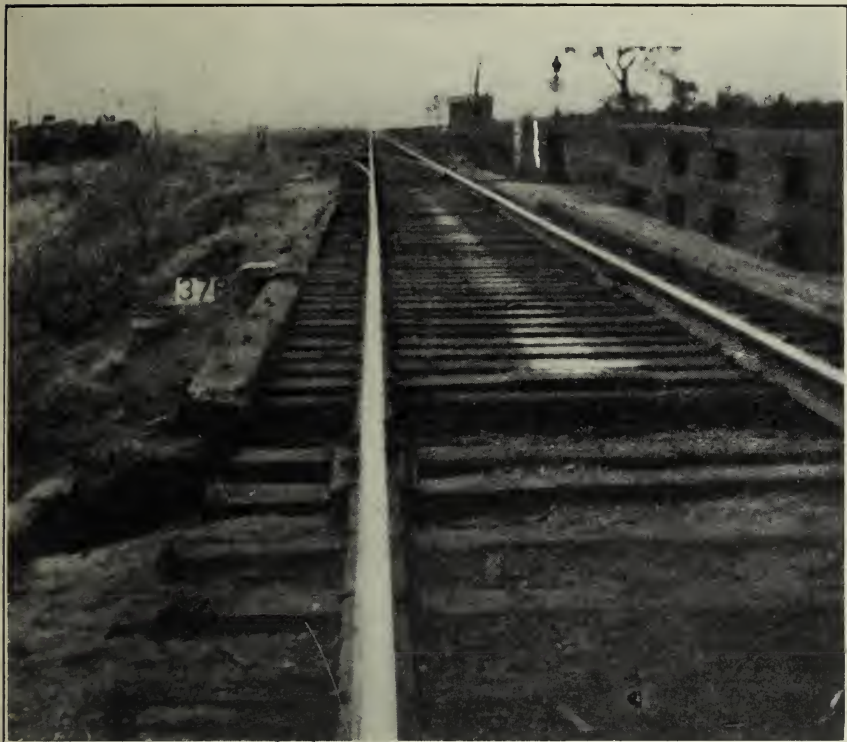
Examination was made of the track from a point one-half mile east of the point of derailment to a point nearly one-half mile west of Chelsea, a total distance of about $1\frac{1}{2}$ miles. The track conditions disclosed by this examination were extremely bad; in fact they were such as to constitute a dangerous menace to the operation of trains in safety.

At a point 1,800 feet east of the point of derailment was found a rail joint at the approach of a bridge where three spikes were so loose as to enable them to be removed by hand. This condition is shown by illustration No. 1.

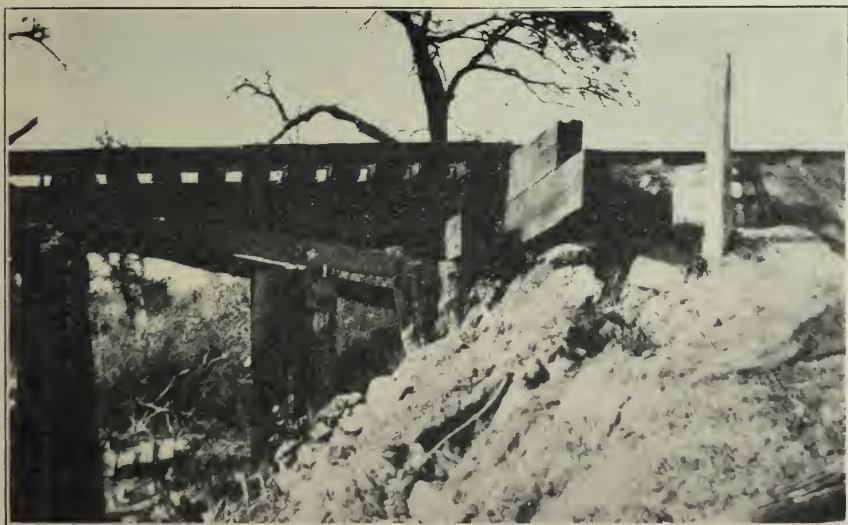
At a point 1,600 feet east of the point of derailment were found two rail joints bolted on only one end, presumably on account of the necessary bolt holes not being drilled in the rail.

At bridge No. 378.1, located approximately 1,100 feet east of the point of derailment, the approaches were found to be in extremely bad condition. Illustration No. 2 shows the condition existing at the eastern approach of this bridge, while illustration No. 3 shows the condition of the ballast at this point, three of the ties having no ballast for a distance of from 2 to 3 feet on the right-hand side. During the course of this examination a train passed over this bridge, and it was found that the track at this approach was depressed 3 inches

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No. 1.—Approach of a bridge at which three spikes were removed by hand from a rail joint.



No. 2.—Conditions existing at eastern approach of bridge No. 378.1.

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under the weight of the train. Illustration No. 4 shows the approach at the western end of this bridge. Notwithstanding the conditions existing at this point, however, there was no slow order governing the operation of trains over this bridge; in fact, the only speed limit of any kind affecting any of the track in this vicinity was the special time-card rule which provided that no passenger train should exceed a speed of 50 miles per hour over this part of the road.

At a point 900 feet east of the point of derailment a rail section was found under which 10 out of the 20 ties were decayed. A total of 30 spikes were removed by hand from the ties under this rail section.



No. 3.—Condition of ballast at eastern approach of bridge No. 378.1.

The condition existing at this point is shown in illustration No. 5, which shows the spikes which were removed by hand.

After the accident and prior to the arrival of the inspectors considerable work was done on the track in the way of surfacing, lining, renewing of ties, etc., and the examination made by them did not disclose anything wrong with the track in the immediate vicinity of the point of derailment.

Bridge No. 379.6 was located nearly 2,700 feet west of the station at Chelsea. Examination of the track for a distance of seven rail lengths east of this bridge showed that out of a total of 134 ties 78 were defective, one rail length having 16 defective ties out of 19 ties

in use. Of the 16 defective ties under this rail 15 were successive ties. In this same distance of seven rail lengths there were 142 loose or missing spikes and 126 spikes which could be removed by hand, a total of 268 spikes out of 536 in use which had practically no holding power. Under the fifth, sixth, and seventh rail lengths east of the bridge there were 96 spikes which could be removed by hand. Illustration No. 6 shows the spikes in this three-rail section which



No. 4.—Conditions existing at western approach of bridge No. 378.1.

were removed by hand. There were also 54 loose or missing spikes in this same three-rail section. In other words, out of 228 spikes in this three-rail section only 78 were serving any practical purpose. Illustration No. 7 shows a rail joint from which all four spikes were removed by hand, the spikes taken from the rail joint being seen resting on the top of the rail. The spikes seen resting against the web of the rail were also removed by hand. Out of 14 rail joints in this seven-rail section only three had all the spikes in good condition.



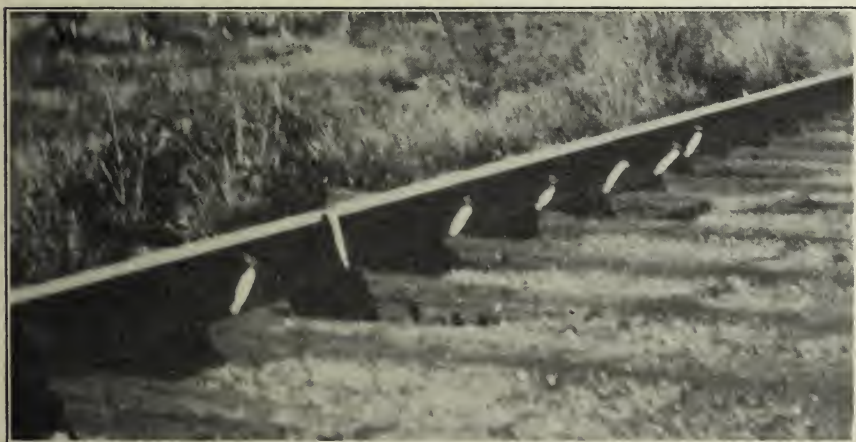
No. 5.—Rail section under which 10 ties were decayed; 30 spikes removed by hand.



No. 6.—Section of three rail lengths from which 96 spikes were removed by hand.



No. 7.—All the spikes in this rail joint removed by hand.



No. 8.—Spikes removed by hand from seven successive ties.

At one point on the inside of the sixth rail from the bridge the spikes were removed by hand from seven successive ties, as shown by illustration No. 8, while at another point embracing parts of rail sections Nos. 6 and 7 the spikes were removed by hand on the outside of the rail from nine successive ties, eight of them being at the end of one rail, while on the inside of the rail at this point the spikes could be removed from six ties, and the spikes were loose on three others.

Division Supt. Cantrell stated that the section in which this accident occurred consisted of between 6 and 7 miles of track, all of which was ballasted five or six years ago. Immediately after the derailment he examined the track with a spirit level, beginning at and extending easterly from the point of derailment, and at no place was there a variation in cross levels of more than one-fourth inch. As a general proposition he considered the track conditions to be good, and would not have been afraid to operate a locomotive over this stretch of track at a speed of 60 miles per hour. This statement, however, only referred to the conditions as he found them for a distance of about 300 feet east of the point of derailment, Supt. Cantrell stating that there might be something wrong with the track farther east. At the time of his examination the track was also found to be in good gauge, and there were no ties which needed renewing.

Roadmaster Campbell stated that 150 ties were broken by the derailment, all of which seemed to be in good condition. He thought the track was good for a speed of 50 miles per hour, with the exception of a few places covered by slow orders. He examined the track with a level and gauge for a distance of 314 feet east of the point of derailment and walked easterly for a distance of about 1 mile. He found the conditions between the point of derailment and bridge No. 378.1 to be good, and stated that 95 per cent, if not more, of the ties were good; in fact, he did not think there were more than five ties in this entire distance of 1,100 feet which should be removed from the track. In his opinion there was nothing between the bridge and the point of derailment which in any way could have contributed to the accident. He rode over this section on a passenger train at about 9 p. m. the night before the derailment, making a check of switch lights, and at this time did not notice any unusual track conditions so far as the movement of the train was concerned. When he made his inspection after the derailment he did not discover the rail length in which there were 30 spikes which could be removed by hand, but stated that had he found them he would at once have taken steps to rectify the condition, as he would have considered it to be dangerous. He stated that there was other track on this particular track section which was in about the same condition as the track in the immediate

vicinity of where this accident occurred. He had had no difficulty in securing the number of ties, spikes, etc., desired for track maintenance. He had 25 sections under his supervision, each section crew consisting of from four to six men. During the last winter this number was reduced, while at times during the past summer there would be only one man on a section, this condition arising on account of the inability to get the number of men desired.

Section Foreman Nesbitt stated that he had been on this section only two months. On the date of the derailment he had three men, having secured an additional man that morning. During the first month of his employment on this section he was only allowed four men, while during the second month he was allowed five men. During this two-month period he had placed about 900 new ties in the track. He stated that he reached the scene of the derailment about one and one-half hours after its occurrence, but on examination of the track could find no clue as to what caused the derailment. The soft spot located about 100 feet east of the point of derailment had to receive frequent attention, it being necessary to line and surface it every day in wet weather. The day before the accident he had lined and surfaced this soft spot, and he stated that between this time and the time of the derailment there had been a little rain. He considered the condition of the ties between bridge No. 378.1 and the point of derailment to be good.

Conductor Powers stated that his first knowledge of anything wrong was when he felt the application of the emergency brakes. The speed of the train had been reduced to about 8 or 10 miles per hour when he felt two distinct shocks. He did not know how fast the train was running, and, as it was dark, the only way he could judge as to the speed was the swaying of the car in which he was riding. He made an examination of the track and also of the running gear of the train, but could find nothing which might have caused the derailment. He thought, however, that the track was in pretty good shape.

Fireman Walrod stated that he thought the speed was about 35 miles per hour. His first knowledge that anything was wrong was when he felt the engine jerk, and he then saw that the forward tender wheels were derailed. He stated that the engineman made what seemed to him to be a service application of the air brakes, but almost immediately placed the brake valve in the emergency position.

Master Machanic Long stated that he made a careful examination of the engine and tender, but could find nothing which might have caused the derailment. He also walked back along the track for some distance, and, while he was not a track expert, it appeared to him that the conditions were considerably above the average.

The employees of westbound train No. 9, which passed over this track a short time previous to the derailment, stated that they noticed

nothing unusual about the riding of the train so far as track conditions were concerned.

Bridge Inspector Van Dolsh stated that he examined bridge No. 378.1 on October 10, at which time he found its condition to be good. On October 30, the day after the derailment, he made another examination of this bridge and found it to be out of line and surface. He thought, however, that it was as safe as any other bridge and safe for the operation of trains over it at a speed of from 45 to 50 miles per hour.

General Superintendent Frates stated that on the day after the accident he made a careful examination of the engine tender, in company with Master Mechanic Forster, and found no bad condition about the wheels; all flanges were in good shape, and there was no unusual wear on any part of them. The clearance between the engine and tender indicated that there had not been any riding of the drawbar. All side bearings and other parts were accounted for, and so far as he and the master mechanic could determine there was no indication that there was anything about the engine, tender, or trucks which could have caused the derailment. He further stated that he made a careful examination of the track and found that the conditions existing at the point of derailment and for a distance of 500 or 600 feet east thereof were unusually good; in fact, better than in most places. An examination was made for a distance of 315 feet east of the point of derailment with a gauge and level. This examination showed that the north rail was one-fourth inch low and the gauge one-fourth inch wide at the point of derailment. The north rail was found to be one-fourth inch low at three other places within a distance of 150 feet, while the south rail was one-fourth inch low at points 99 and 196 feet from the point of derailment. The gauge was found to be correct at all points, with the exception above noted.

In a distance of 520 feet he found only two ties which, in his opinion, should be removed from the track. His detailed examination did not cover the track east of this point. He stated, however, that he walked back to a point more than a mile east of bridge No. 378.1: up to the bridge the track conditions were good, but beyond the bridge neither the ties nor the general condition of the track was so good, and he told the superintendent to have the track put in shape.

While the cause of this accident was not definitely determined, it is believed that the track conditions were not safe for the operation of trains at the speed permitted, and that these conditions caused the tender of the locomotive hauling this train to rock back and forth until finally the forward wheels were derailed.

As will be seen from their statements, the officials and employees of this railroad considered the track conditions approaching the point of derailment to be very good. Between bridge No. 378.1 and

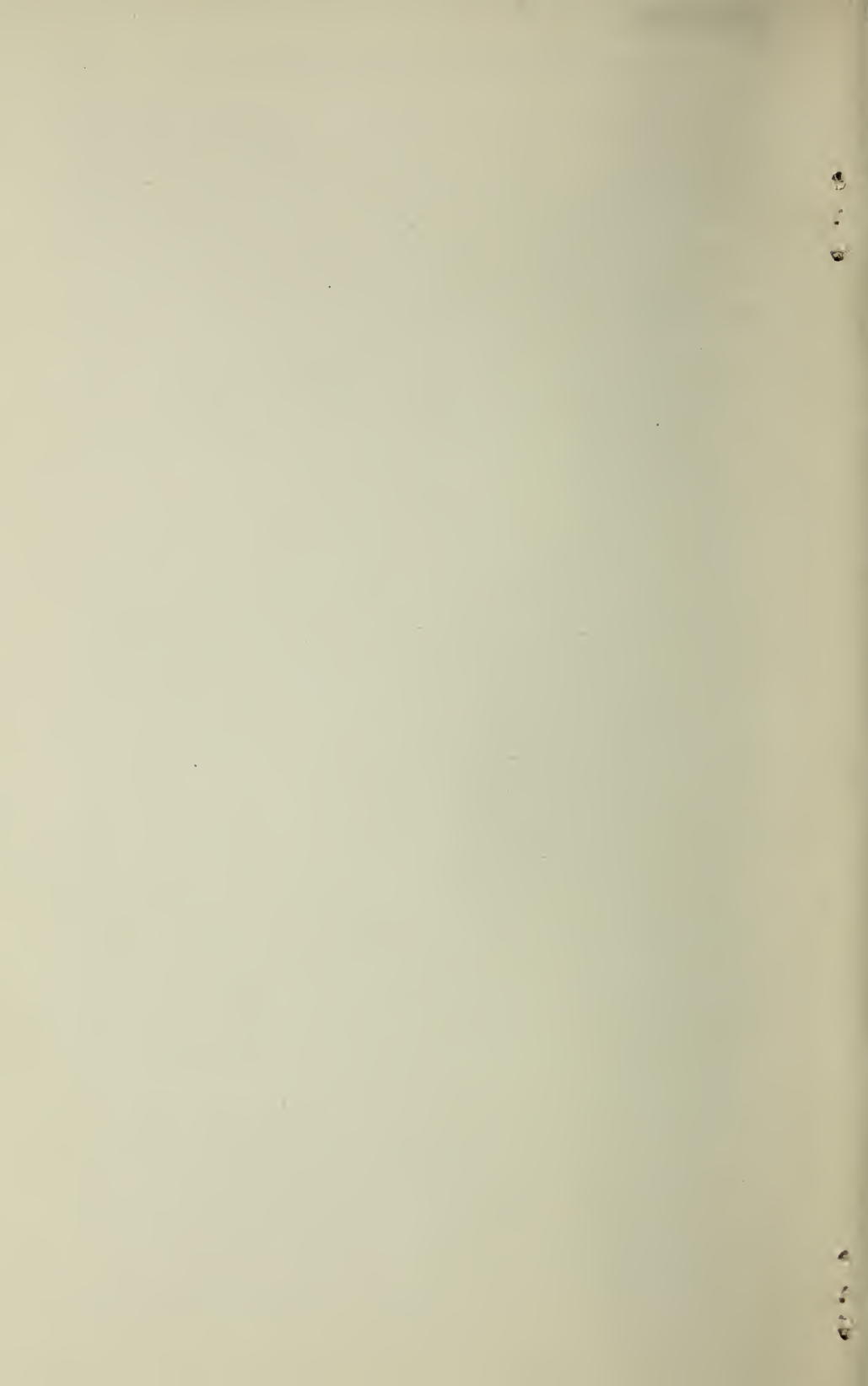
the point of derailment none of them found anything to be wrong with the track. In view of the conditions, however, which, as a matter of fact, were found to exist, it is impossible to believe that the examinations made by the officials and employees could have been anything but superficial in the extreme. It is true, of course, that the examinations made by them were confined to that part of the track immediately east of the point of derailment, and for this reason would not include the seven rail lengths east of bridge No. 379.6, but it is difficult to understand how they could have failed to discover the conditions existing upon that part of the track examined by them, particularly the one-rail section where 10 out of 20 ties were decayed and where 30 spikes were removed by hand. It is equally hard to understand how the most ordinary system of inspection or maintenance could have permitted to exist such a dangerous condition as was found immediately east of bridge No. 379.6.

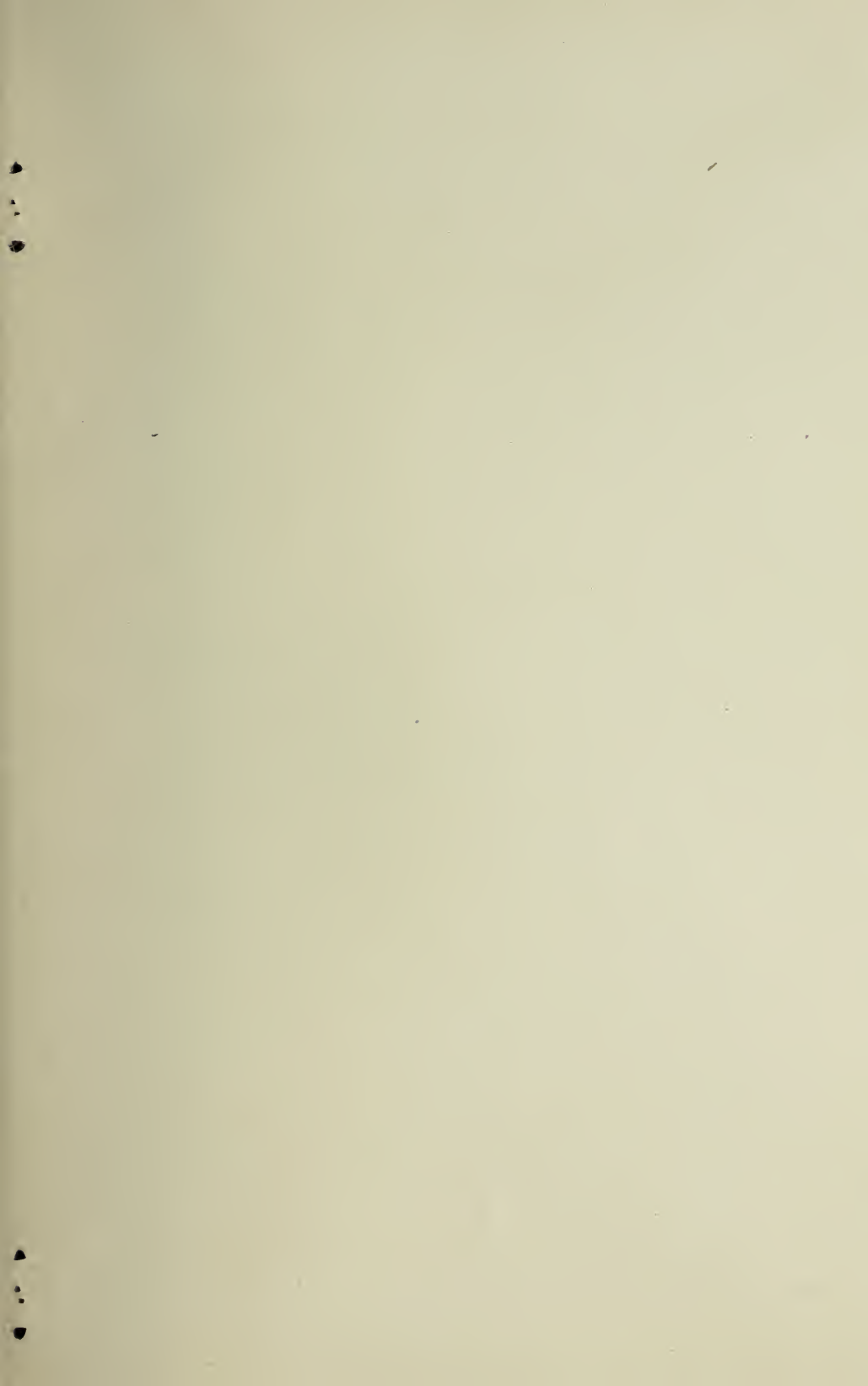
The existence of track conditions such as was disclosed by this investigation constitutes a dangerous menace to the traveling public, and vigorous measures toward remedying these conditions should be taken at once. In its twenty-sixth annual report the commission called attention to the fact that with the track and roadway conditions existing upon many railroads in this country the danger of serious derailments was ever present, while, in the report covering the investigation of the accident which occurred on the Mobile & Ohio Railroad near Buckatunna, Miss., on October 19, 1913, attention was called to derailments investigated since July 1, 1911, where the speed of the trains involved was a more or less direct cause of derailment, particular mention being made of the fact that out of the 16 derailments listed, in only 3 cases were the trains involved being operated in excess of the speed limit allowed. There was every reason to believe that, in view of the existing track conditions, had the speed been properly restricted, and had these restrictions been observed, all of the derailments would probably have been averted. This same general principle applies in the case of this accident. Had the operating officials of this railroad made themselves familiar with the existing track conditions, and had they restricted the speed of trains in accordance with such knowledge, it is believed that this accident would not have occurred.

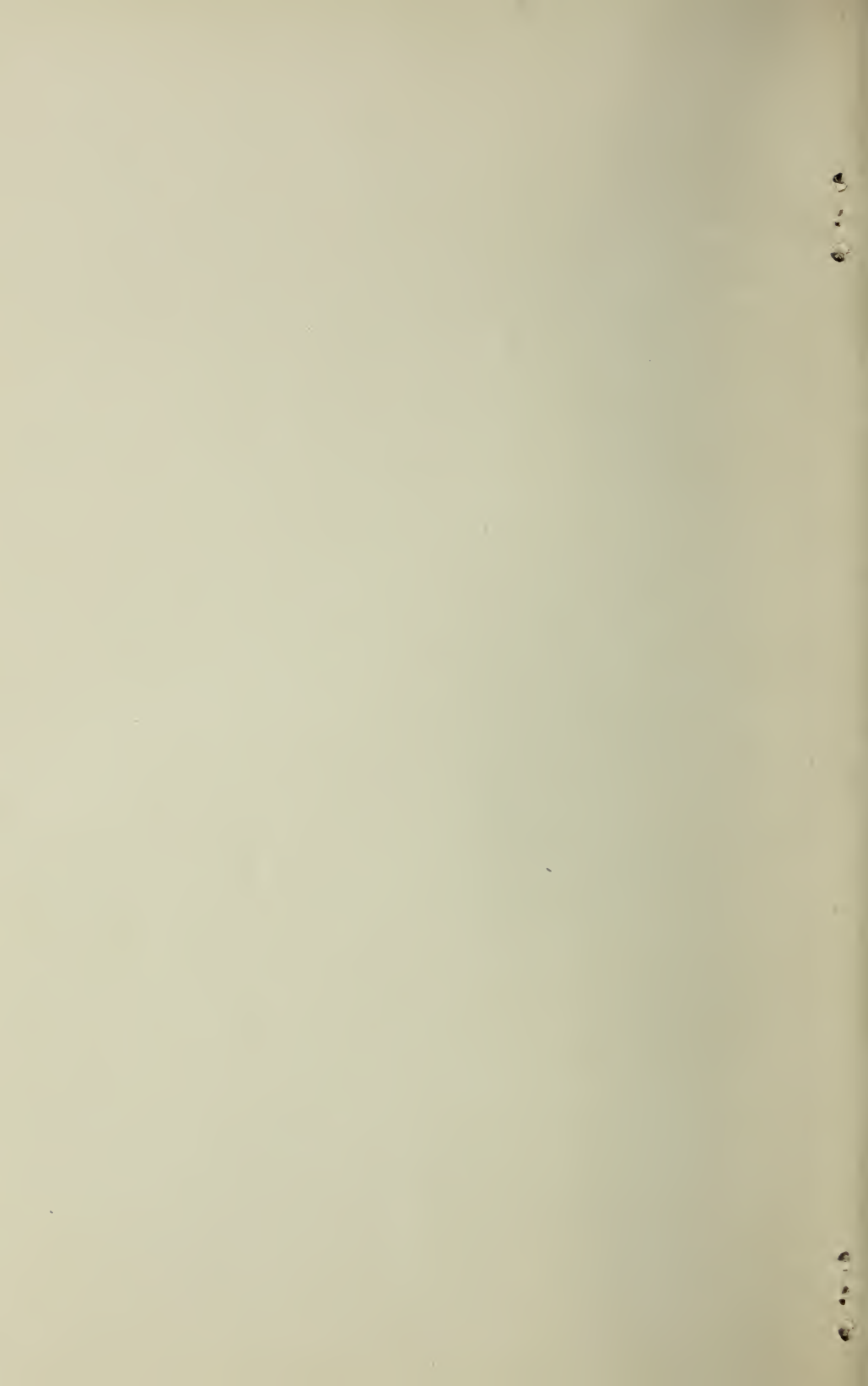
Respectfully submitted.

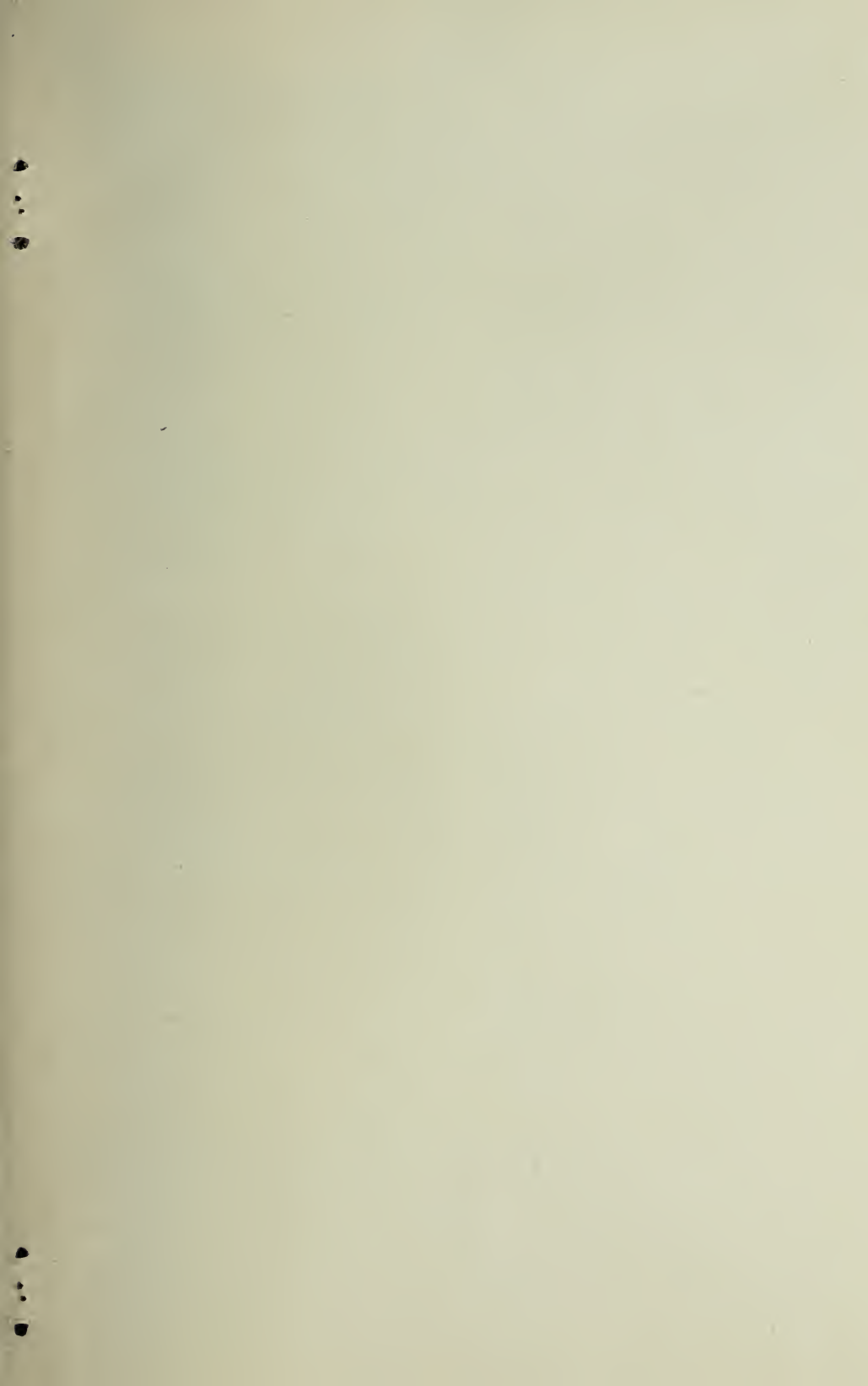
H. W. BELNAP,
Chief Inspector of Safety Appliances.













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